

Default cuts

Sample	SRA	SRB	SRC	SRD	SRE	SRF	SRG
$\mu$ ttdl	$343.1 \pm 6.3$ (3426)	$204.2 \pm 4.8$ (2052)	$69.7 \pm 2.8$ (689)	$24.3 \pm 1.7$ (241)	$9.8 \pm 1.1$ (94)	$4.5 \pm 0.7$ (42)	$2.5 \pm 0.6$ (22)
$\mu$ ttsl	$47.1 \pm 2.2$ (539)	$32.6 \pm 1.9$ (360)	$6.5 \pm 0.8$ (73)	$2.2 \pm 0.5$ (20)	$0.5 \pm 0.2$ (5)	$0.1 \pm 0.1$ (1)	$0.0 \pm 0.0$ (0)
$\mu$ wjets	$17.4 \pm 1.9$ (101)	$7.9 \pm 1.2$ (49)	$3.0 \pm 0.7$ (18)	$1.9 \pm 0.6$ (11)	$0.3 \pm 0.3$ (2)	$0.1 \pm 0.1$ (1)	$0.1 \pm 0.1$ (1)
$\mu$ ttV	$18.2 \pm 1.8$ (921)	$13.8 \pm 1.5$ (741)	$5.6 \pm 0.9$ (354)	$2.7 \pm 0.6$ (179)	$1.7 \pm 0.6$ (88)	$0.6 \pm 0.3$ (37)	$0.5 \pm 0.3$ (23)
$\mu$ tWdl	$12.4 \pm 1.6$ (67)	$7.2 \pm 1.3$ (37)	$2.5 \pm 0.7$ (13)	$1.7 \pm 0.6$ (8)	$1.0 \pm 0.5$ (4)	$0.5 \pm 0.3$ (2)	$0.5 \pm 0.3$ (2)
$\mu$ tWsl	$6.7 \pm 1.1$ (39)	$5.8 \pm 1.1$ (36)	$1.4 \pm 0.5$ (8)	$1.0 \pm 0.5$ (5)	$0.7 \pm 0.4$ (3)	$0.4 \pm 0.3$ (2)	$0.4 \pm 0.3$ (2)
$\mu$ VV	$1.6 \pm 0.2$ (106)	$1.1 \pm 0.2$ (74)	$0.7 \pm 0.1$ (44)	$0.2 \pm 0.1$ (19)	$0.1 \pm 0.1$ (9)	$0.1 \pm 0.0$ (5)	$0.0 \pm 0.0$ (3)
$\mu$ VVV	$0.3 \pm 0.0$ (143)	$0.3 \pm 0.0$ (121)	$0.2 \pm 0.0$ (87)	$0.1 \pm 0.0$ (56)	$0.1 \pm 0.0$ (39)	$0.1 \pm 0.0$ (25)	$0.0 \pm 0.0$ (16)
$\mu$ DY+jets	$0.6 \pm 0.2$ (20)	$0.2 \pm 0.1$ (6)	$0.1 \pm 0.1$ (2)	$0.1 \pm 0.1$ (2)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
$\mu$ data muo	$494.0 \pm 22.2$ (494)	$254.0 \pm 15.9$ (254)	$76.0 \pm 8.7$ (76)	$31.0 \pm 5.6$ (31)	$8.0 \pm 2.8$ (8)	$2.0 \pm 1.4$ (2)	$1.0 \pm 1.0$ (1)
$\mu$ data ele	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e ttdl	$275.8 \pm 5.8$ (2629)	$161.6 \pm 4.4$ (1568)	$57.5 \pm 2.6$ (543)	$20.1 \pm 1.5$ (190)	$6.9 \pm 0.9$ (70)	$2.6 \pm 0.5$ (25)	$1.3 \pm 0.4$ (13)
e ttsl	$37.0 \pm 2.0$ (412)	$24.3 \pm 1.7$ (261)	$6.4 \pm 0.9$ (66)	$2.2 \pm 0.5$ (22)	$0.5 \pm 0.2$ (4)	$0.4 \pm 0.2$ (3)	$0.3 \pm 0.2$ (2)
e wjets	$11.5 \pm 1.5$ (65)	$7.4 \pm 1.3$ (37)	$2.7 \pm 0.8$ (12)	$1.5 \pm 0.6$ (7)	$0.5 \pm 0.3$ (2)	$0.3 \pm 0.3$ (1)	$0.3 \pm 0.3$ (1)
e ttV	$13.1 \pm 1.5$ (692)	$8.4 \pm 1.1$ (512)	$3.2 \pm 0.5$ (255)	$1.5 \pm 0.4$ (113)	$0.6 \pm 0.1$ (58)	$0.3 \pm 0.1$ (27)	$0.1 \pm 0.0$ (10)
e tWdl	$10.7 \pm 1.5$ (56)	$6.4 \pm 1.2$ (35)	$3.4 \pm 0.9$ (18)	$1.2 \pm 0.6$ (5)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e tWsl	$4.4 \pm 0.9$ (30)	$4.1 \pm 0.9$ (28)	$1.0 \pm 0.5$ (6)	$0.6 \pm 0.4$ (2)	$0.3 \pm 0.3$ (1)	$0.3 \pm 0.3$ (1)	$0.3 \pm 0.3$ (1)
e VV	$1.3 \pm 0.2$ (85)	$0.7 \pm 0.1$ (44)	$0.3 \pm 0.1$ (15)	$0.1 \pm 0.0$ (6)	$0.0 \pm 0.0$ (2)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e VVV	$0.3 \pm 0.0$ (132)	$0.2 \pm 0.0$ (96)	$0.1 \pm 0.0$ (61)	$0.1 \pm 0.0$ (40)	$0.1 \pm 0.0$ (26)	$0.0 \pm 0.0$ (18)	$0.0 \pm 0.0$ (11)
e DY+jets	$0.5 \pm 0.1$ (12)	$0.2 \pm 0.1$ (3)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e data muo	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e data ele	$367.0 \pm 19.2$ (367)	$202.0 \pm 14.2$ (202)	$74.0 \pm 8.6$ (74)	$30.0 \pm 5.5$ (30)	$15.0 \pm 3.9$ (15)	$7.0 \pm 2.6$ (7)	$2.0 \pm 1.4$ (2)
Sample	SRA	SRB	SRC	SRD	SRE	SRF	SRG
$e/\mu$ ttdl	$618.9 \pm 8.5$	$365.9 \pm 6.5$	$127.2 \pm 3.9$	$44.4 \pm 2.3$	$16.7 \pm 1.4$	$7.1 \pm 0.9$	$3.8 \pm 0.7$
$e/\mu$ ttsl	$84.1 \pm 3.0$	$56.8 \pm 2.5$	$12.9 \pm 1.2$	$4.4 \pm 0.7$	$1.0 \pm 0.3$	$0.5 \pm 0.3$	$0.3 \pm 0.2$
$e/\mu$ wjets	$28.9 \pm 2.4$	$15.3 \pm 1.8$	$5.7 \pm 1.1$	$3.5 \pm 0.8$	$0.8 \pm 0.4$	$0.4 \pm 0.3$	$0.4 \pm 0.3$
$e/\mu$ ttV	$31.3 \pm 2.3$	$22.2 \pm 1.8$	$8.8 \pm 1.0$	$4.2 \pm 0.7$	$2.3 \pm 0.6$	$0.9 \pm 0.3$	$0.6 \pm 0.3$
$e/\mu$ tWdl	$23.1 \pm 2.3$	$13.7 \pm 1.7$	$5.9 \pm 1.2$	$2.9 \pm 0.8$	$1.0 \pm 0.5$	$0.5 \pm 0.3$	$0.5 \pm 0.3$
$e/\mu$ tWsl	$11.1 \pm 1.5$	$9.8 \pm 1.4$	$2.4 \pm 0.7$	$1.6 \pm 0.6$	$1.0 \pm 0.5$	$0.7 \pm 0.4$	$0.7 \pm 0.4$
$e/\mu$ VV	$2.8 \pm 0.3$	$1.8 \pm 0.2$	$1.0 \pm 0.2$	$0.3 \pm 0.1$	$0.2 \pm 0.1$	$0.1 \pm 0.0$	$0.0 \pm 0.0$
$e/\mu$ VVV	$0.6 \pm 0.0$	$0.5 \pm 0.0$	$0.4 \pm 0.0$	$0.2 \pm 0.0$	$0.2 \pm 0.0$	$0.1 \pm 0.0$	$0.1 \pm 0.0$
$e/\mu$ DY+jets	$1.1 \pm 0.2$	$0.4 \pm 0.1$	$0.1 \pm 0.1$	$0.1 \pm 0.1$	$0.0 \pm 0.0$	$0.0 \pm 0.0$	$0.0 \pm 0.0$
$e/\mu$ data muo	$494.0 \pm 22.2$	$254.0 \pm 15.9$	$76.0 \pm 8.7$	$31.0 \pm 5.6$	$8.0 \pm 2.8$	$2.0 \pm 1.4$	$1.0 \pm 1.0$
$e/\mu$ data ele	$367.0 \pm 19.2$	$202.0 \pm 14.2$	$74.0 \pm 8.6$	$30.0 \pm 5.5$	$15.0 \pm 3.9$	$7.0 \pm 2.6$	$2.0 \pm 1.4$

$E/p_{IN} < 4$  GeV cut removed

Sample	SRA	SRB	SRC	SRD	SRE	SRF	SRG
$\mu$ ttdl	$343.1 \pm 6.3$ (3426)	$204.2 \pm 4.8$ (2052)	$69.7 \pm 2.8$ (689)	$24.3 \pm 1.7$ (241)	$9.8 \pm 1.1$ (94)	$4.5 \pm 0.7$ (42)	$2.5 \pm 0.6$ (22)
$\mu$ ttsl	$47.1 \pm 2.2$ (539)	$32.6 \pm 1.9$ (360)	$6.5 \pm 0.8$ (73)	$2.2 \pm 0.5$ (20)	$0.5 \pm 0.2$ (5)	$0.1 \pm 0.1$ (1)	$0.0 \pm 0.0$ (0)
$\mu$ wjets	$17.4 \pm 1.9$ (101)	$7.9 \pm 1.2$ (49)	$3.0 \pm 0.7$ (18)	$1.9 \pm 0.6$ (11)	$0.3 \pm 0.3$ (2)	$0.1 \pm 0.1$ (1)	$0.1 \pm 0.1$ (1)
$\mu$ ttV	$18.2 \pm 1.8$ (921)	$13.8 \pm 1.5$ (741)	$5.6 \pm 0.9$ (354)	$2.7 \pm 0.6$ (179)	$1.7 \pm 0.6$ (88)	$0.6 \pm 0.3$ (37)	$0.5 \pm 0.3$ (23)
$\mu$ tWdl	$12.4 \pm 1.6$ (67)	$7.2 \pm 1.3$ (37)	$2.5 \pm 0.7$ (13)	$1.7 \pm 0.6$ (8)	$1.0 \pm 0.5$ (4)	$0.5 \pm 0.3$ (2)	$0.5 \pm 0.3$ (2)
$\mu$ tWsl	$6.7 \pm 1.1$ (39)	$5.8 \pm 1.1$ (36)	$1.4 \pm 0.5$ (8)	$1.0 \pm 0.5$ (5)	$0.7 \pm 0.4$ (3)	$0.4 \pm 0.3$ (2)	$0.4 \pm 0.3$ (2)
$\mu$ VV	$1.6 \pm 0.2$ (106)	$1.1 \pm 0.2$ (74)	$0.7 \pm 0.1$ (44)	$0.2 \pm 0.1$ (19)	$0.1 \pm 0.1$ (9)	$0.1 \pm 0.0$ (5)	$0.0 \pm 0.0$ (3)
$\mu$ VVV	$0.3 \pm 0.0$ (143)	$0.3 \pm 0.0$ (121)	$0.2 \pm 0.0$ (87)	$0.1 \pm 0.0$ (56)	$0.1 \pm 0.0$ (39)	$0.1 \pm 0.0$ (25)	$0.0 \pm 0.0$ (16)
$\mu$ DY+jets	$0.6 \pm 0.2$ (20)	$0.2 \pm 0.1$ (6)	$0.1 \pm 0.1$ (2)	$0.1 \pm 0.1$ (2)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
$\mu$ data muo	$494.0 \pm 22.2$ (494)	$254.0 \pm 15.9$ (254)	$76.0 \pm 8.7$ (76)	$31.0 \pm 5.6$ (31)	$8.0 \pm 2.8$ (8)	$2.0 \pm 1.4$ (2)	$1.0 \pm 1.0$ (1)
$\mu$ data ele	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e ttdl	$279.8 \pm 5.8$ (2669)	$163.6 \pm 4.4$ (1589)	$58.2 \pm 2.6$ (551)	$20.4 \pm 1.6$ (194)	$7.1 \pm 0.9$ (72)	$2.6 \pm 0.5$ (26)	$1.3 \pm 0.4$ (13)
e ttsl	$37.6 \pm 2.1$ (419)	$24.5 \pm 1.7$ (263)	$6.4 \pm 0.9$ (66)	$2.2 \pm 0.5$ (22)	$0.5 \pm 0.2$ (4)	$0.4 \pm 0.2$ (3)	$0.3 \pm 0.2$ (2)
e wjets	$11.5 \pm 1.5$ (65)	$7.4 \pm 1.3$ (37)	$2.7 \pm 0.8$ (12)	$1.5 \pm 0.6$ (7)	$0.5 \pm 0.3$ (2)	$0.3 \pm 0.3$ (1)	$0.3 \pm 0.3$ (1)
e ttV	$13.5 \pm 1.5$ (701)	$8.8 \pm 1.2$ (518)	$3.6 \pm 0.7$ (256)	$1.5 \pm 0.4$ (113)	$0.6 \pm 0.1$ (58)	$0.3 \pm 0.1$ (27)	$0.1 \pm 0.0$ (10)
e tWdl	$10.7 \pm 1.5$ (56)	$6.4 \pm 1.2$ (35)	$3.4 \pm 0.9$ (18)	$1.2 \pm 0.6$ (5)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e tWsl	$4.4 \pm 0.9$ (30)	$4.1 \pm 0.9$ (28)	$1.0 \pm 0.5$ (6)	$0.6 \pm 0.4$ (2)	$0.3 \pm 0.3$ (1)	$0.3 \pm 0.3$ (1)	$0.3 \pm 0.3$ (1)
e VV	$1.3 \pm 0.2$ (86)	$0.7 \pm 0.1$ (45)	$0.3 \pm 0.1$ (16)	$0.1 \pm 0.0$ (7)	$0.0 \pm 0.0$ (2)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e VVV	$0.3 \pm 0.0$ (135)	$0.2 \pm 0.0$ (98)	$0.1 \pm 0.0$ (63)	$0.1 \pm 0.0$ (41)	$0.1 \pm 0.0$ (27)	$0.1 \pm 0.0$ (19)	$0.0 \pm 0.0$ (12)
e DY+jets	$0.5 \pm 0.1$ (12)	$0.2 \pm 0.1$ (3)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e data muo	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e data ele	$368.0 \pm 19.2$ (368)	$203.0 \pm 14.2$ (203)	$74.0 \pm 8.6$ (74)	$30.0 \pm 5.5$ (30)	$15.0 \pm 3.9$ (15)	$7.0 \pm 2.6$ (7)	$2.0 \pm 1.4$ (2)
Sample	SRA	SRB	SRC	SRD	SRE	SRF	SRG
$e/\mu$ ttdl	$622.9 \pm 8.5$	$367.8 \pm 6.5$	$127.9 \pm 3.9$	$44.7 \pm 2.3$	$16.9 \pm 1.4$	$7.1 \pm 0.9$	$3.8 \pm 0.7$
$e/\mu$ ttsl	$84.7 \pm 3.0$	$57.1 \pm 2.5$	$12.9 \pm 1.2$	$4.4 \pm 0.7$	$1.0 \pm 0.3$	$0.5 \pm 0.3$	$0.3 \pm 0.2$
$e/\mu$ wjets	$28.9 \pm 2.4$	$15.3 \pm 1.8$	$5.7 \pm 1.1$	$3.5 \pm 0.8$	$0.8 \pm 0.4$	$0.4 \pm 0.3$	$0.4 \pm 0.3$
$e/\mu$ ttV	$31.8 \pm 2.4$	$22.6 \pm 1.9$	$9.2 \pm 1.1$	$4.2 \pm 0.7$	$2.3 \pm 0.6$	$0.9 \pm 0.3$	$0.6 \pm 0.3$
$e/\mu$ tWdl	$23.1 \pm 2.3$	$13.7 \pm 1.7$	$5.9 \pm 1.2$	$2.9 \pm 0.8$	$1.0 \pm 0.5$	$0.5 \pm 0.3$	$0.5 \pm 0.3$
$e/\mu$ tWsl	$11.1 \pm 1.5$	$9.8 \pm 1.4$	$2.4 \pm 0.7$	$1.6 \pm 0.6$	$1.0 \pm 0.5$	$0.7 \pm 0.4$	$0.7 \pm 0.4$
$e/\mu$ VV	$2.9 \pm 0.3$	$1.8 \pm 0.2$	$1.0 \pm 0.2$	$0.3 \pm 0.1$	$0.2 \pm 0.1$	$0.1 \pm 0.0$	$0.0 \pm 0.0$
$e/\mu$ VVV	$0.6 \pm 0.0$	$0.5 \pm 0.0$	$0.4 \pm 0.0$	$0.2 \pm 0.0$	$0.2 \pm 0.0$	$0.1 \pm 0.0$	$0.1 \pm 0.0$
$e/\mu$ DY+jets	$1.1 \pm 0.2$	$0.4 \pm 0.1$	$0.1 \pm 0.1$	$0.1 \pm 0.1$	$0.0 \pm 0.0$	$0.0 \pm 0.0$	$0.0 \pm 0.0$
$e/\mu$ data muo	$494.0 \pm 22.2$	$254.0 \pm 15.9$	$76.0 \pm 8.7$	$31.0 \pm 5.6$	$8.0 \pm 2.8$	$2.0 \pm 1.4$	$1.0 \pm 1.0$
$e/\mu$ data ele	$368.0 \pm 19.2$	$203.0 \pm 14.2$	$74.0 \pm 8.6$	$30.0 \pm 5.5$	$15.0 \pm 3.9$	$7.0 \pm 2.6$	$2.0 \pm 1.4$

$E/p_{IN} < 4$  GeV and absolute isolation  $< 5$  GeV cuts removed

Sample	SRA	SRB	SRC	SRD	SRE	SRF	SRG
$\mu$ ttdl	$364.5 \pm 6.4$ (3640)	$216.1 \pm 5.0$ (2175)	$73.7 \pm 2.9$ (729)	$26.2 \pm 1.7$ (259)	$10.8 \pm 1.1$ (103)	$5.1 \pm 0.8$ (48)	$2.7 \pm 0.6$ (24)
$\mu$ ttsl	$50.3 \pm 2.3$ (576)	$34.6 \pm 1.9$ (381)	$6.9 \pm 0.9$ (78)	$2.4 \pm 0.5$ (22)	$0.6 \pm 0.3$ (6)	$0.1 \pm 0.1$ (1)	$0.0 \pm 0.0$ (0)
$\mu$ wjets	$19.4 \pm 2.0$ (111)	$9.0 \pm 1.3$ (55)	$3.3 \pm 0.8$ (20)	$2.1 \pm 0.6$ (12)	$0.5 \pm 0.3$ (3)	$0.3 \pm 0.2$ (2)	$0.3 \pm 0.2$ (2)
$\mu$ ttV	$20.1 \pm 1.9$ (983)	$15.3 \pm 1.6$ (788)	$6.0 \pm 0.9$ (382)	$2.8 \pm 0.6$ (192)	$1.8 \pm 0.6$ (94)	$0.7 \pm 0.3$ (40)	$0.5 \pm 0.3$ (26)
$\mu$ tWdl	$13.6 \pm 1.7$ (73)	$7.6 \pm 1.3$ (40)	$2.5 \pm 0.7$ (14)	$1.7 \pm 0.6$ (8)	$1.0 \pm 0.5$ (4)	$0.5 \pm 0.3$ (2)	$0.5 \pm 0.3$ (2)
$\mu$ tWsl	$6.7 \pm 1.1$ (39)	$5.8 \pm 1.1$ (36)	$1.4 \pm 0.5$ (8)	$1.0 \pm 0.5$ (5)	$0.7 \pm 0.4$ (3)	$0.4 \pm 0.3$ (2)	$0.4 \pm 0.3$ (2)
$\mu$ VV	$1.7 \pm 0.2$ (115)	$1.2 \pm 0.2$ (78)	$0.8 \pm 0.1$ (48)	$0.2 \pm 0.1$ (20)	$0.1 \pm 0.1$ (10)	$0.1 \pm 0.0$ (5)	$0.0 \pm 0.0$ (3)
$\mu$ VVV	$0.3 \pm 0.0$ (149)	$0.3 \pm 0.0$ (128)	$0.2 \pm 0.0$ (92)	$0.1 \pm 0.0$ (60)	$0.1 \pm 0.0$ (42)	$0.1 \pm 0.0$ (27)	$0.0 \pm 0.0$ (18)
$\mu$ DY+jets	$0.6 \pm 0.2$ (20)	$0.2 \pm 0.1$ (6)	$0.1 \pm 0.1$ (2)	$0.1 \pm 0.1$ (2)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
$\mu$ data muo	$519.0 \pm 22.8$ (519)	$265.0 \pm 16.3$ (265)	$82.0 \pm 9.1$ (82)	$31.0 \pm 5.6$ (31)	$8.0 \pm 2.8$ (8)	$2.0 \pm 1.4$ (2)	$1.0 \pm 1.0$ (1)
$\mu$ data ele	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e ttdl	$305.7 \pm 6.1$ (2912)	$177.3 \pm 4.6$ (1717)	$64.5 \pm 2.8$ (610)	$23.8 \pm 1.7$ (227)	$8.6 \pm 1.0$ (87)	$3.4 \pm 0.6$ (34)	$1.4 \pm 0.4$ (16)
e ttsl	$42.9 \pm 2.2$ (469)	$26.1 \pm 1.7$ (280)	$6.4 \pm 0.9$ (67)	$2.2 \pm 0.5$ (22)	$0.5 \pm 0.2$ (4)	$0.4 \pm 0.2$ (3)	$0.3 \pm 0.2$ (2)
e wjets	$12.8 \pm 1.6$ (73)	$8.0 \pm 1.3$ (41)	$3.0 \pm 0.8$ (14)	$1.8 \pm 0.6$ (8)	$0.7 \pm 0.4$ (3)	$0.3 \pm 0.3$ (1)	$0.3 \pm 0.3$ (1)
e ttV	$14.4 \pm 1.6$ (767)	$9.9 \pm 1.3$ (571)	$4.2 \pm 0.8$ (280)	$1.6 \pm 0.4$ (126)	$0.6 \pm 0.1$ (64)	$0.3 \pm 0.1$ (29)	$0.1 \pm 0.0$ (12)
e tWdl	$11.2 \pm 1.6$ (58)	$6.8 \pm 1.2$ (36)	$3.4 \pm 0.9$ (18)	$1.2 \pm 0.6$ (5)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e tWsl	$5.1 \pm 1.0$ (33)	$4.6 \pm 1.0$ (30)	$1.5 \pm 0.6$ (8)	$0.6 \pm 0.4$ (2)	$0.3 \pm 0.3$ (1)	$0.3 \pm 0.3$ (1)	$0.3 \pm 0.3$ (1)
e VV	$1.3 \pm 0.2$ (88)	$0.7 \pm 0.1$ (46)	$0.3 \pm 0.1$ (16)	$0.1 \pm 0.0$ (7)	$0.0 \pm 0.0$ (2)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e VVV	$0.3 \pm 0.0$ (145)	$0.2 \pm 0.0$ (107)	$0.2 \pm 0.0$ (70)	$0.1 \pm 0.0$ (46)	$0.1 \pm 0.0$ (31)	$0.1 \pm 0.0$ (23)	$0.0 \pm 0.0$ (15)
e DY+jets	$0.7 \pm 0.2$ (16)	$0.2 \pm 0.1$ (4)	$0.1 \pm 0.1$ (1)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e data muo	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e data ele	$402.0 \pm 20.0$ (402)	$221.0 \pm 14.9$ (221)	$77.0 \pm 8.8$ (77)	$31.0 \pm 5.6$ (31)	$15.0 \pm 3.9$ (15)	$7.0 \pm 2.6$ (7)	$2.0 \pm 1.4$ (2)
Sample	SRA	SRB	SRC	SRD	SRE	SRF	SRG
$e/\mu$ ttdl	$670.2 \pm 8.9$	$393.4 \pm 6.8$	$138.2 \pm 4.0$	$50.0 \pm 2.4$	$19.4 \pm 1.5$	$8.5 \pm 1.0$	$4.1 \pm 0.7$
$e/\mu$ ttsl	$93.1 \pm 3.2$	$60.7 \pm 2.6$	$13.3 \pm 1.2$	$4.6 \pm 0.7$	$1.1 \pm 0.4$	$0.5 \pm 0.3$	$0.3 \pm 0.2$
$e/\mu$ wjets	$32.3 \pm 2.6$	$17.0 \pm 1.9$	$6.4 \pm 1.1$	$3.9 \pm 0.9$	$1.2 \pm 0.5$	$0.6 \pm 0.3$	$0.6 \pm 0.3$
$e/\mu$ ttV	$34.6 \pm 2.5$	$25.2 \pm 2.0$	$10.2 \pm 1.2$	$4.4 \pm 0.7$	$2.4 \pm 0.6$	$1.0 \pm 0.3$	$0.6 \pm 0.3$
$e/\mu$ tWdl	$24.8 \pm 2.3$	$14.4 \pm 1.8$	$5.9 \pm 1.2$	$2.9 \pm 0.8$	$1.0 \pm 0.5$	$0.5 \pm 0.3$	$0.5 \pm 0.3$
$e/\mu$ tWsl	$11.8 \pm 1.5$	$10.3 \pm 1.4$	$2.9 \pm 0.8$	$1.6 \pm 0.6$	$1.0 \pm 0.5$	$0.7 \pm 0.4$	$0.7 \pm 0.4$
$e/\mu$ VV	$3.0 \pm 0.3$	$1.9 \pm 0.2$	$1.1 \pm 0.2$	$0.3 \pm 0.1$	$0.2 \pm 0.1$	$0.1 \pm 0.0$	$0.0 \pm 0.0$
$e/\mu$ VVV	$0.7 \pm 0.0$	$0.5 \pm 0.0$	$0.4 \pm 0.0$	$0.3 \pm 0.0$	$0.2 \pm 0.0$	$0.1 \pm 0.0$	$0.1 \pm 0.0$
$e/\mu$ DY+jets	$1.3 \pm 0.2$	$0.4 \pm 0.1$	$0.1 \pm 0.1$	$0.1 \pm 0.1$	$0.0 \pm 0.0$	$0.0 \pm 0.0$	$0.0 \pm 0.0$
$e/\mu$ data muo	$519.0 \pm 22.8$	$265.0 \pm 16.3$	$82.0 \pm 9.1$	$31.0 \pm 5.6$	$8.0 \pm 2.8$	$2.0 \pm 1.4$	$1.0 \pm 1.0$
$e/\mu$ data ele	$402.0 \pm 20.0$	$221.0 \pm 14.9$	$77.0 \pm 8.8$	$31.0 \pm 5.6$	$15.0 \pm 3.9$	$7.0 \pm 2.6$	$2.0 \pm 1.4$

$E/p_{IN} < 4$  GeV and absolute iso  $< 5$  GeV and  $|p_T^{pflep} - p_T^{recolep}| < 10$  GeV  
cuts removed

Sample	SRA	SRB	SRC	SRD	SRE	SRF	SRG
$\mu$ tt $\bar{d}$	$364.7 \pm 6.5$ (3642)	$216.1 \pm 5.0$ (2175)	$73.7 \pm 2.9$ (729)	$26.2 \pm 1.7$ (259)	$10.8 \pm 1.1$ (103)	$5.1 \pm 0.8$ (48)	$2.7 \pm 0.6$ (24)
$\mu$ tt $\bar{s}$	$50.4 \pm 2.3$ (577)	$34.6 \pm 1.9$ (381)	$6.9 \pm 0.9$ (78)	$2.4 \pm 0.5$ (22)	$0.6 \pm 0.3$ (6)	$0.1 \pm 0.1$ (1)	$0.0 \pm 0.0$ (0)
$\mu$ wjets	$19.4 \pm 2.0$ (111)	$9.0 \pm 1.3$ (55)	$3.3 \pm 0.8$ (20)	$2.1 \pm 0.6$ (12)	$0.5 \pm 0.3$ (3)	$0.3 \pm 0.2$ (2)	$0.3 \pm 0.2$ (2)
$\mu$ ttV	$20.2 \pm 1.9$ (984)	$15.3 \pm 1.6$ (789)	$6.0 \pm 0.9$ (383)	$2.8 \pm 0.6$ (192)	$1.8 \pm 0.6$ (94)	$0.7 \pm 0.3$ (40)	$0.5 \pm 0.3$ (26)
$\mu$ tW $\bar{d}$	$13.6 \pm 1.7$ (73)	$7.6 \pm 1.3$ (40)	$2.5 \pm 0.7$ (14)	$1.7 \pm 0.6$ (8)	$1.0 \pm 0.5$ (4)	$0.5 \pm 0.3$ (2)	$0.5 \pm 0.3$ (2)
$\mu$ tW $\bar{s}$	$6.7 \pm 1.1$ (39)	$5.8 \pm 1.1$ (36)	$1.4 \pm 0.5$ (8)	$1.0 \pm 0.5$ (5)	$0.7 \pm 0.4$ (3)	$0.4 \pm 0.3$ (2)	$0.4 \pm 0.3$ (2)
$\mu$ VV	$1.7 \pm 0.2$ (116)	$1.2 \pm 0.2$ (79)	$0.8 \pm 0.1$ (48)	$0.2 \pm 0.1$ (20)	$0.1 \pm 0.1$ (10)	$0.1 \pm 0.0$ (5)	$0.0 \pm 0.0$ (3)
$\mu$ VVV	$0.3 \pm 0.0$ (150)	$0.3 \pm 0.0$ (129)	$0.2 \pm 0.0$ (92)	$0.1 \pm 0.0$ (60)	$0.1 \pm 0.0$ (42)	$0.1 \pm 0.0$ (27)	$0.0 \pm 0.0$ (18)
$\mu$ DY+jets	$0.6 \pm 0.2$ (20)	$0.2 \pm 0.1$ (6)	$0.1 \pm 0.1$ (2)	$0.1 \pm 0.1$ (2)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
$\mu$ data muo	$519.0 \pm 22.8$ (519)	$265.0 \pm 16.3$ (265)	$82.0 \pm 9.1$ (82)	$31.0 \pm 5.6$ (31)	$8.0 \pm 2.8$ (8)	$2.0 \pm 1.4$ (2)	$1.0 \pm 1.0$ (1)
$\mu$ data ele	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e tt $\bar{d}$	$311.5 \pm 6.1$ (2970)	$179.4 \pm 4.6$ (1739)	$65.0 \pm 2.8$ (615)	$24.1 \pm 1.7$ (230)	$8.8 \pm 1.0$ (89)	$3.5 \pm 0.6$ (35)	$1.4 \pm 0.4$ (16)
e tt $\bar{s}$	$44.0 \pm 2.2$ (480)	$26.4 \pm 1.7$ (284)	$6.6 \pm 0.9$ (68)	$2.2 \pm 0.5$ (22)	$0.5 \pm 0.2$ (4)	$0.4 \pm 0.2$ (3)	$0.3 \pm 0.2$ (2)
e wjets	$13.3 \pm 1.7$ (76)	$8.4 \pm 1.4$ (43)	$3.2 \pm 0.9$ (15)	$2.0 \pm 0.7$ (9)	$0.9 \pm 0.5$ (4)	$0.5 \pm 0.3$ (2)	$0.3 \pm 0.3$ (1)
e ttV	$15.1 \pm 1.6$ (780)	$10.5 \pm 1.3$ (579)	$4.5 \pm 0.8$ (283)	$1.6 \pm 0.4$ (127)	$0.6 \pm 0.1$ (64)	$0.3 \pm 0.1$ (29)	$0.1 \pm 0.0$ (12)
e tW $\bar{d}$	$11.7 \pm 1.6$ (60)	$7.1 \pm 1.3$ (37)	$3.7 \pm 0.9$ (19)	$1.5 \pm 0.6$ (6)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e tW $\bar{s}$	$5.3 \pm 1.0$ (34)	$4.6 \pm 1.0$ (30)	$1.5 \pm 0.6$ (8)	$0.6 \pm 0.4$ (2)	$0.3 \pm 0.3$ (1)	$0.3 \pm 0.3$ (1)	$0.3 \pm 0.3$ (1)
e VV	$1.4 \pm 0.2$ (90)	$0.7 \pm 0.1$ (47)	$0.3 \pm 0.1$ (16)	$0.1 \pm 0.0$ (7)	$0.0 \pm 0.0$ (2)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e VVV	$0.3 \pm 0.0$ (147)	$0.2 \pm 0.0$ (108)	$0.2 \pm 0.0$ (70)	$0.1 \pm 0.0$ (46)	$0.1 \pm 0.0$ (31)	$0.1 \pm 0.0$ (23)	$0.0 \pm 0.0$ (15)
e DY+jets	$0.7 \pm 0.2$ (16)	$0.2 \pm 0.1$ (4)	$0.1 \pm 0.1$ (1)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e data muo	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)	$0.0 \pm 0.0$ (0)
e data ele	$418.0 \pm 20.4$ (418)	$233.0 \pm 15.3$ (233)	$82.0 \pm 9.1$ (82)	$34.0 \pm 5.8$ (34)	$15.0 \pm 3.9$ (15)	$7.0 \pm 2.6$ (7)	$2.0 \pm 1.4$ (2)
Sample	SRA	SRB	SRC	SRD	SRE	SRF	SRG
e/ $\mu$ tt $\bar{d}$	$676.2 \pm 8.9$	$395.5 \pm 6.8$	$138.7 \pm 4.0$	$50.3 \pm 2.4$	$19.6 \pm 1.5$	$8.6 \pm 1.0$	$4.1 \pm 0.7$
e/ $\mu$ tt $\bar{s}$	$94.4 \pm 3.2$	$61.0 \pm 2.6$	$13.5 \pm 1.2$	$4.6 \pm 0.7$	$1.1 \pm 0.4$	$0.5 \pm 0.3$	$0.3 \pm 0.2$
e/ $\mu$ wjets	$32.8 \pm 2.6$	$17.4 \pm 1.9$	$6.6 \pm 1.2$	$4.1 \pm 0.9$	$1.4 \pm 0.5$	$0.8 \pm 0.4$	$0.6 \pm 0.3$
e/ $\mu$ ttV	$35.2 \pm 2.5$	$25.8 \pm 2.1$	$10.5 \pm 1.2$	$4.4 \pm 0.7$	$2.4 \pm 0.6$	$1.0 \pm 0.3$	$0.6 \pm 0.3$
e/ $\mu$ tW $\bar{d}$	$25.2 \pm 2.4$	$14.7 \pm 1.8$	$6.2 \pm 1.2$	$3.2 \pm 0.9$	$1.0 \pm 0.5$	$0.5 \pm 0.3$	$0.5 \pm 0.3$
e/ $\mu$ tW $\bar{s}$	$12.0 \pm 1.5$	$10.3 \pm 1.4$	$2.9 \pm 0.8$	$1.6 \pm 0.6$	$1.0 \pm 0.5$	$0.7 \pm 0.4$	$0.7 \pm 0.4$
e/ $\mu$ VV	$3.1 \pm 0.3$	$1.9 \pm 0.2$	$1.1 \pm 0.2$	$0.3 \pm 0.1$	$0.2 \pm 0.1$	$0.1 \pm 0.0$	$0.0 \pm 0.0$
e/ $\mu$ VVV	$0.7 \pm 0.0$	$0.5 \pm 0.0$	$0.4 \pm 0.0$	$0.3 \pm 0.0$	$0.2 \pm 0.0$	$0.1 \pm 0.0$	$0.1 \pm 0.0$
e/ $\mu$ DY+jets	$1.3 \pm 0.2$	$0.4 \pm 0.1$	$0.1 \pm 0.1$	$0.1 \pm 0.1$	$0.0 \pm 0.0$	$0.0 \pm 0.0$	$0.0 \pm 0.0$
e/ $\mu$ data muo	$519.0 \pm 22.8$	$265.0 \pm 16.3$	$82.0 \pm 9.1$	$31.0 \pm 5.6$	$8.0 \pm 2.8$	$2.0 \pm 1.4$	$1.0 \pm 1.0$
e/ $\mu$ data ele	$418.0 \pm 20.4$	$233.0 \pm 15.3$	$82.0 \pm 9.1$	$34.0 \pm 5.8$	$15.0 \pm 3.9$	$7.0 \pm 2.6$	$2.0 \pm 1.4$